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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 10/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/890,698

Applicant(s)

CANNING ET AL.

Examiner

Martin J Angebrannt

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-- The MAILING DATE of this c mmunication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/4/2001, 10/9/2001 & 1/8/2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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1. The response of the applicant has been read and given careful consideration.
2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-20, drawn to a method of laser processing waveguiding devices to augment their optical characteristics.

Group II, claim(s) 21, drawn to a waveguiding device, which has altered optical characteristics.

3. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Any feature which unites the inventions fails to make a contribution over the prior art in view of the references marked X in the PCT search report of 14 March 2000.

4. During a telephone conversation with Richard Streit (25,765) on July 9, 2003 a provisional election was made with traverse to prosecute the invention of group I, claims 1-20. Affirmation of this election must be made by applicant in replying to this Office action. Claim 23 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The examiner also notes that the two groupings are classified in different areas of the PTO and therefore a search burden exists.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the

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application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

6. Applicant's election with traverse of group I in Paper No. 9 (08222003) is acknowledged. The traversal is on the ground(s) that the claims are not non-unitary and would not add any burden of search. This is not found persuasive because the claims are classified in different areas of the office (class 430 vs class 385) and are factually considered non-unitary under PCT practice on the basis of the search report of 14 March 2000 as evidenced by the citation of seven (7) "X" references.

The requirement is still deemed proper and is therefore made FINAL.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-4,7-12,14,16,17 and 19 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Bjork et al. '652.

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Bjork et al. '652 describes with respect to figure 4a and 4b, the laser ablation of the silica (SiO_2) fiber, followed by the evaporation of a thin metal layer to form a polarizer. Figure 5 shows data from this polarizer when a 214 nm thick Al/W metal layer was used. The laser used is a carbon dioxide TEA laser having the properties described in column 4 at lines 25-60. The wavelength of the laser is 10.6 microns (10,600 nm). The disclosure with respect to figures 3a-c teaches couplers made from ablated fibers, which are fused. The use of a dye or other absorber applied to the fiber as a coating to enhance ablation is disclosed. (3/16-26)

The examiner holds that any ablation leaves a mark. The examiner notes that with respect to claim 17, not all markings would change the optical characteristics. (merely marking the cladding with a marking to be read by a user for identifying the different types generally (and usually preferably) does not affect the optical properties of the fiber. Accordingly, the examiner has read marking in claim to exclude merely marking cladding.

10. Claims 1-4, 7-12, 14, 16, 17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjork et al. '652.

It would have been obvious to one skilled in the art to modify the invention corresponding to the process illustrated in figures 3a-c or 4a and b by adding a dye in a layer to increase the absorption based upon the disclosure to do so at column 3, lines 16-26 of the reference.

11. Claims 1, 3, 4, 6 and 17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Burns et al. '061.

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Burns et al. '061 describes with respect to figure 2 and figure 3, the removal of a portion of one of the arms of a Mach-Zehnder interferometer using an excimer laser (UV). (An interferometer is a measuring device). (3/18-4/20).

12. Claims 1,3,4,12,13,16,17 and 19 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Archambault et al., "High Reflectivity and Narrow Bandwidth Fibre Gratings Written by Single Excimer Pulse.", Electron. Lett., Vol. 29(1) pp. 28-29 (01/1993) .

Archambault et al., "High Reflectivity and Narrow Bandwidth Fibre Gratings Written by Single Excimer Pulse.", Electron. Lett., Vol. 29(1) pp. 28-29 (01/1993) teaches the use of excimer lasers to ablatively write gratings into germania doped silica optical fibers.

The unimaged optical fiber is considered an optical device. (see claim 16)

13. Claims 1,3,4,9 and 17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by O'Brian et al. '763.

O'Brian et al. '763 teaches the laser ablative etching of the optical waveguides leaves a slag which deteriorates the optical quality of the waveguide material (2/53-59). This is removed by ultrasonication (2/53-55) or polishing (2/44-46). A Nd:YAG laser is used to form trenches by laser ablation. After ablation, polishing is used to remove the slag. The grooves are used to couple optical fibers to the waveguides.(figure 3)

14. Claims 1,3-6,9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Burns et al. '061 or O'Brian et al. '763, in view of Chang et al. '371.

Chang et al. '371 teaches the use of a metallic layer to acts as a mask to prevent melting of adjacent areas. (12/18-37, 13/29-52 and 14/44-15/24).

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It would have been obvious to one skilled in the art to modify the process of either Burns et al. '061 or O'Brian et al. '763 by using the masking process of Chang et al. '371 to reduce the thermal damage to areas adjacent to those being ablated and limit the areas ablated as taught by Chang et al. '371.

15. Claims 1-4,16,17 and 19 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Allen et al. '913.

Allen et al. '913 describe the use of carbon dioxide lasers (10.6 micron output) for forming taps in silica based optical fibers. (6/1-24 and 4/21-33)

16. Claims 1-4,7-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al. '565, in view of Allen et al. '913 or Bjork et al. '652.

Jain et al. '565 teach the etching of optical fibers to allow electrodes to be placed near the optical core to allow poling of the optical fibers. This is followed by the deposition of the electrodes. This allows the polarization of the light to be changed. The use of laser etching is disclosed. (9/9/35-37) The formation of gratings using UV light is also disclosed.

It would have been obvious to one skilled in the art to use the disclosed laser etching in the process of Jain et al. '565 as it is old and well known in the art for etchings optical fibers as taught by Allen et al. '913 or Bjork et al. '652 and does not require hazardous chemicals like chemical etchings or a vacuum chamber like ion etching.

17. Claims 1,3,9,17 and 19 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Tsunemoto et al. EP 0838701.

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Tsunemoto et al. EP 0838701 teach modifying the optical coupling ability of a waveguide using a 355 nm output of a tripled Nd:YAG to ablate a silica glass based optical waveguide.

(3/48-4/11).

18. Claims 1,3,7-10,17 and 19 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Jelley et al. '900.

Jelley et al. '900 teach the use of an excimer laser to pattern a waveguide to produce an optical reflector (mirror). This is subsequently coated with metal. (3/17-5/26)

19. Claims 1,3,4,12,13 and 15-17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Byron '680.

Byron '680 teaches the exposure of an optical fiber to a periodic pattern to form ripples in the surface of the fiber, which form gratings.

20. Claims 1,3,4,7-11, and 17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Man et al. '186.

Man et al. '186 teach with respect to figure 3a, the ablation of the cladding layer (26) using an excimer laser to remove polymer and the coating of this with a smoothing layer and an electrode layer. (11/11-25)

21. Claims 1,3,4,7,8,15, and 17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Chiang et al. '211.

Chiang et al. '211 teach the formation of a planar waveguide with poled areas, followed by excimer laser ablation to form a ridge waveguide and the overcoating of this with another cladding layer.

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22. Claims 1,3,4,12,13,16,17 and 19 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Cullen '740.

Cullen '740 teaches using a carbon dioxide laser to ablate periodic portions of the fiber to form a filter.

23. Claims 1-4,7-12,14 and 16-20 rejected under 35 U.S.C. 103(a) as being unpatentable over either Bjork et al. '652, Jelley et al. '900, Chiang et al. '211 or Allen et al. '913, in view of Lin '879.

Lin '879 teaches the functional equivalence of diode lasers, excimer lasers, YAG lasers and carbon dioxide lasers in laser etching optical components (ocular lenses) (4/5-18)

It would have been obvious to one skilled in the art to modify the processes of either Bjork et al. '652, Jelley et al. '900, Chiang et al. '211 or Allen et al. '913 by using other lasers known to be useful in the laser ablation of optics with a reasonable expectation of success based upon the disclosure of equivalence by Lin '879.

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fischer et al. '039 teaches laser processing of waveguides including the use of metal masking.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 703-308-4397.

The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J. Angebranndt
Primary Examiner
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October 23, 2003